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ABSTRACT

A study was undertaken in order to examine (1) the nature of the representation or prototypes underlying children's make-believe object uses, (2) the types of mental activities through which objects are allowed to substitute for real objects, and (3) the awareness children have of processes involved in their choosing and pretending. A total of 18 boys and 12 girls enrolled in two preschool programs participated. Ranging in age from 3 years 11 months to 5 years 5 months, children were divided into two groups matched for age, sex, and preschool program. In a laboratory setting, an experimenter individually invited each child to join her in playing a game. Following a brief introductory period, the experimenter began one of two "scripts" randomly assigned to the subject. Basically, the scripts established a game of pretend including an action requiring a particular implement (e.g., eating ice cream with a spoon). The play setting provided objects that were primary candidates for fulfilling the function of the needed implement as well as "distractors." Results indicated that children made accommodations to the demand characteristics of a systematically varied fantasy context and focused primarily on the criterion of function in selecting objects. Spontaneous talk revealed children's reflectiveness in considering object suitability and their awareness of their own processes of evaluation and pretending. (Author/RH)

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Structure and Function in Constructivism: Examples From Children's Play And Language

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The notion of a Constructivist theory in the context of Early Childhood Education may not appear so radical at first glance as it does upon further reflection. After all, haven't most of the ECE curricula been activity-based and built largely upon assumptions of development that derive from Functional Psychology? However, Piaget has been the Prime Mover of recent Child Psychology and has been adopted by ECE in spite of the well-known fact that he is a Structuralist, not a Functionalist. I think what has made Piaget attractive and acceptable to ECE is that inherent in his Constructivism are the threads of a functionalist theory. So, part of what I plan to discuss in the course of this presentation has to do with the functional psychology of Jean Piaget. I do not intend to discuss Piaget's theory directly; instead, I plan to present Constructivism as Piaget's 'functionalism". Play behaviors and language of young children are the vehicles for exemplifying my points.

Quite a number of attempts have been made at defining Constructivism. I think the basic assumption of Constructivism is also its best definition. The terms "constructive" and "construction" in a Constructivist theory of intelligence (and what is really better described in this context as a <u>theory of learning</u>) mean that the learner contributes to his or her own knowledge. Any new learning products are as much a function of the learner's pre-existing knowledge as of the new experiences.

Why do we even need to think about such differences as Structuralism and Functionalism? The two systems have different accounts

of how knowledge ought to be systematized. In trying to synthesize our subject matter, we tend to come up, first, with broad dichotomies--processes versus products quickly come to mind. Piaget stated broad concerns about phylogeny versus ontogeny in development. I think some recent reflections from the biological sciences offer another good way for making broad categories and these, in turn, reflect structural-functional concerns. We can speak of proximal and ultimate causes of behavior. In biology, for example, physiology, biochemistry, embryology, etc. are functional categories that deal with proximal causes of observed phenomena. Evolutionary biology, by contrast, deals with ultimate explanations, focusing on Structural explanations. In psychology, Constructivism or functionalism is the account of proximal causes of behavior, while Structuralism, in Piaget's system, seeks to build explanations of the ultimate products. Hence, Piaget's theory of intelligence is structural, while his theory of learning is functional, or in his terms, constructivist. Constructivism, within the system, is an attempt to clarify the concepts that are crucial to mertal development.

One of the proximal causes of behavior that interests psychologists and that is certainly important in early childhood education is conceptual development and its related areas, conceptual learning and concept formation. I don't believe that anyone would challenge the central role concept formation takes in accounting for intellectual growth. All investigators on this topic, Smith & Medin as recent writers on the subject, point out

that mental life would be chaotic without concepts to give some organization, some structure, to experiences. Memory, communication, mental systematization of diverse experiences, and so forth are all dependent on concepts. Concepts give our world stability, as well as providing vehicles for going beyond perceptual information to make inferences--in essence, to think.

Those of us who study concept formation have different approaches, based largely upon what we think concepts are and what constitute the relevant components. Again, Smith & Medin have summarized the prevailing views of concepts. The most common viewpoint, at least until recent years, was the classical, Aristotlean view. In the classical sense, there are properties common to all objects that belong to the same class, and the method of investigation is to look at the acquisition of category features and corresponding class-membership status. It's not difficult to think of examples of this type of concept: for geometrical figures to be classified as squares, the following criteria must be met: 1) 4 sides; 2) equal length sides; 3) equal angles; 4) closed figure. Rectangles, rhomboids, equilateral triangles, therefore, are easily excluded by these criteria.

As an alternative to the classical definition, people began to talk about prototypes and prototypic concepts. This is a probabilistic account of concepts, and by such an account, items in a category can vary in the degree to which they embody the concept. In this view, then, rectangles approximate squareness. Smith & Medin provide another good example: tea cups: 1) concavity; 2) hold liquids;

3) handles; 4) used for hot beverages. It's not hard to think of an exception: Tea cups in a Chinese restaurant would not fit the bill in a classical sense, but are acceptable along the prototype lines--they fulfill most of the essential criteria. Paper cups for picnics also challenge the classical definition, but are easily classified because they fit the prototype of a cup. So, in the probabilistic view, the members of a class embody most if not all of the properties used to evaluate that class. Think of criteria for classifying dogs and the criteria for classifying rats: the criteria of furryness, four-leggedness, size, etc. are relative, but when you come to a creature like a Chihuahua, where would it fit by each of the classical & prototypic definitions?

A third way in which psychologists have construed concepts in their studies is what Smith & Medin term the Exemplary view. This perspective is especially relevant to clinical psychology. Patients often cannot be classified along strict, definitive, all-inclusive criteria, and in terms of the probabilistic viewpoint, it would be difficult to specify which, out of the finite set of criteria, are the critical aspects and which can be relaxed. Clinicians have found it more useful to compare a patient against a profile or against a specific case study, rather than rely on specific descriptors. In this view, an Exemplar is most useful, not unitary descriptors.

For the question of What is learned in concept formation? one's view of what concepts are is not trivial. It is not trivial to Constructivism or to ECE. Clearly, different things are learned in each of these accounts of concept formation.

The following, then, have to be considered in an account of concept acquisition:

1-what information is essential to the category

2-what is unnecessary

3-how can various properties be separated and combined--their disjunctiveness, such as a receiver and a dial in the concept, telephone)

4-what are the boundaries of the concept, so that hard-to-classify members are understood for their in-inclusion and/or exclusion into classes.

5-do summary, exemplary representations convey the concept adequately, or less well than unitary criteria.

Don't we already know quite a lot about this kind of learning from the child development literature? Children's language learning has been a fertile area for this kind of research, so that we know, in general terms, that children:

1-make only the 'good' matches of class-membership, along farily ostensible and limited featural lines;

2-that 'overgeneralization' occurs as class members exceed the membership boundaries---and eventually more classes result from the over-blown, catch-all groups;

3-that concept boundaries and concept features are refined so that similarities are not the only criteria of classification, but that discrimination also takes an important role.

These two discussion points---the kinds of concepts that are developed, and the ways concepts are formed in young children---lead me back to wonder about the Constructivism/functionalism issue. The three views of concept types--classical, probabilistic, and exemplary--as well as the developmental descriptions of concept formation all seem to focus on "features" of the class members. Do these views of concepts and concept learning always have to be "featurally" or"structurally" based?

My hypothesis was, in fact, that Constructivism à la Piaget would predict some functional prototypes of class-objects. There is a big literature on object prototypicality and the transformational boundaries children employ as they choose their play objects, (Fein, or Golomb, E.G.). It's generally been found that young children find it easier to make object transformations if, in their play, one object is highly prototypical so as to provide support for other, less realistic objects. Others (e.g., Ungerer, Zelazo, Kearsley, & O'Leary, 1981, e.g.) have also wondered if children would move increasingly away from physically similar signifiers and utilize physically dissimilar signified objects. This kind of object-substitution research focuses specifically upon form and features of objects. What about the purposes for which children are making their selections as they selectively go through the available alternatives? In other words, what about the object functions?

It was our hypothesis that children do not carry a fixed image of a given object for which they seek the closest approximation possible in play. Rather, from our observations and preliminary data, we were led to believe that children choose an object for pretending on the basis of the role the object will play in their particular pretense situations. This is obviously true at the practical level. For example, if children want a spaceship they can board, they will pick an object that is at least child-size and perhaps large enough to enclose one of them. However, what is of more interest is whether an anticipated imaginary function would make a difference as well. That is, when there is no immediate physical necessity in taking Object A over Object B, does the function the child is imagining for the object make a difference? For example, if a child is considering a pretend sequence in which s/he will pour into a cup, it does not matter in any practical sense whether or not the "cup" used in the play is concave, since there is no liquid. At least to us, it doesn't matter; does it matter to the child? If the property of concavity matters for situations in which the cup is to hold an imaginary liquid but not for others, such as pretending to wash the cup, this fact would indicate that differentiation according to function is part of the mental activity of the imagining process. So, in our research, we asked: To what extend does the child judge correspondence between referent and substitute according to the function the object will have in make-believe play?

Function and Prototypes

We were interested in examining this question in a systematic way, and we chose children's dramatic play situations as the vehicle. Two groups of subjects were involved in two contrasting fantasy scenarios. The same object would be needed for one purpose in one scenario and for an entirely different purpose in another scenario. For example, half of the subjects would need a spoon for stirring make-believe lemonade and half would need it for scooping imaginary ice cream. We reasoned that if the children made different spoon choices depending on the differing functions, this would suggest that the children were operating with prototypes or representations which were at least partially function-specific.

Language Representation and Symbolic Play

We were interested in what the children said and did along with their object choices. These behaviors potentially provide insight in several ways. Suppose a child says, "This will be my phone. Pretend it has a dial." The message reveals, first, something about the child's idea of what a phone should be like, at least in the given context. By looking at what many children say or do in the same situation, we might discover some interesting regularities. For example, do children often mention physical features which are irrelevant to the demand characteristics of the pretense situation (e.g., "Pretend it's black like a phone")? With respect to the function criterion, do children focus on physical features which are relevant to the present requirements

or are they equally likely to note functional features of the object that would currently be irrelevant (e.g., a dial when the scenario only calls for answering the phone)?

To summarize the objectives of the current study, we examined whether children would discriminate in their choices of objects according to the purpose the object was to serve in pretend play, given specific functional demand characteristics. We were interested in the verbalizations and gestures which transformed the selected objects into the props required for performing the make-believe situations, and therefore incorporated these behaviors into our investigation, as well. That is, when the child chose an object which did not ostensibly have the feature needed to serve the function the scenario demanded, we expected that it would often be supplied verbally or gesturally. Within the age range of the study (3 years, 11 months to 5 years, 5 months) we did not expect differences in the basic tendency to select object substitutes according to function. Our interest was in the emergence of children's <u>awareness</u> of their own evaluating processes in selecting objects for symbolic use. This reflectiveness was expected to emerge in children's comments, both unelicited and elicited during an interview with the experimenter.

An Experimental Approach To The Study Of Object Function In Symbolic Play *

Method

Subjects

Eighteen boys and twelve girls who were enrolled in two preschool programs participated in the study. Ranging in age from 3:11 to 5:5, these children were divided into two groups of subjects that were matched for age, sex, and preschool program. Script I was used with one group and Script II was used with the other, as described in Table 1.

Setting

Children were brought to a small laboratory room on an individual basis. In this setting, they engaged in dramatic play sessions with a female experimenter who was familiar to all of them. Initially, the experimenter and the child sat at a child's table and talked in order to establish the play situation. A toy cash register was nearby on the table, and behind the experimenter were various boxes, drawers, and cupboards where the child was told there would be objects they could use in the games. Each of the drawers of the chest, doors to the cupboard, and the various

* This research was conducted in collaboration with C. E. Copple and W.S. Matthews under a Biomedical Research Support Grant, No. 1-S07-RR05729-02.

boxes was distinguished by different colored circles. 11

The play interactions were videotaped through one-way windows between the small play room and the control booth. The technology of this laboratory was sufficient to ensure high quality audio recording of the children's verbalizations.

Procedure

The experimenter invited each child, one at a time, to join her in playing a game. As she and the child entered the play-room, the experimenter suggested that they pretend to be store-keepers. She pointed out the cash register and permitted the child to play with it. Following a brief introductory period, the experimenter began one of the two "scripts" which was randomly assigned to the subject. The experimenter took the lead in indicating general and specific points of the plot for the play, including the need for various objects. Two warm-up items were given during this introductory period (see Table 1). The warm-up items were similar to the subsequent coded trials, as can be seen. These warm-up items were designed to draw the child into the make-believe set and to assure that the child understood the expectations of the situation. In both warm-up and actual trials, the experimenter's requests for various objects were made in a casual manner, with the experimenter indicating to the child the content of the pretend episode and the place in which an appropriate object might be found; e.g.,

> "Now let's pretend Mr. McGhee is in the store. He says he wants to look around a bit and then he'll have some ice cream. We'll need a spoon

for scooping out some ice cream. In the box with the white dots there should be a bunch of things. OK? See what you find in there that will make a good spoon". (Script I)

The contrasting portion of Script II was very similar except that the use for which the imaginary spoon was being requested was stirring lemonade instead of scooping ice cream. In each case, the seemingly critical attribute for Script I would differ from that of Script II. In the case of the spoons, for example, a long stick-like piece is suited for stirring while a concave object would be better for actual scooping (see Table 1). In Table 1 the uses for which the objects were requested in Script I and Script II are shown.

Insert Table 1 About Here

Figure 1 shows the six objects that were in the box the child had to sort through to find a spoon. The primary candidates for choices of spoons are the plastic eggshell (Script I) and the rod (Script II), both in the foreground. The four other objects were included as "distractors" in order to reduce the likelihood of the children's picking the target object by chance.

Insert Figure 1 About Here

The situation was not designed as one in which the children would be passive and mute. It was important that they be involved as contributors to the pretending as much as

possible given the constraints of the experimental situation. Embellishments of the make-believe premise by the children were welcome and occurred frequently.

Interview

The child was asked to demonstrate the target function after making each object choice. For Script I, the following was said:

> "Here's the ice cream box (experimenter handing child a cigar box). Now, you give Mr. McGhee some ice cream."

In Script II, the child was asked to demonstrate the use of the object that had been selected, as follows:

> "Now, you get the lemonade ready for Mr. McGhee. It isn't mixed yet."

Even if the child had not chosen the function-related object, the procedures allowed individual modification of the object through action in performing the target function. For example, if in Script I the child had chosen the wooden rod (stirrer), she or he might give evidence of attending to the target function by using a scooping motion.

The experimenter prompted the child in the following manner if the object's use was not demonstrated:

> "Show me how you would use that; show me how you would use that as a_____(spoon for scooping ice cream); etc."

A verbal interview followed the child's demonstration of each object's use. When Script I was the basis for the play scenes, the child was asked:

> "Is that a good spoon for scooping ice cream? Is there anything not good about it? Is there anything we need to pretend was different to make it a better spoon for scooping ice cream?"

When Script II was used, the experimenter asked the child comparable questions regarding the suitability of the object for stirring lemonade.

In this part of the procedure, the child was given the opportunity to describe attributes of the chosen object which made it suitable for performing the target function. This procedure also afforded the child the chance to note and discuss object discrepancies even if a nontarget object were chosen, that is, an object other than one we judged appropriate for performing the specified function. Thus, there was ample opportunity to learn the child's rationale for the object choice and to observe how the selection would be used. A nontarget object could be used to serve the requisite function by the child's supplying verbal modifications or transforming the object through actions.

Coding and Scoring Protocols

Each trial was coded as either a target or a nontarget object choice. In a few cases, objects were chosen in combinations. If the child failed to choose the target object on a

given trial, coders next evaluated whether or not the child gave evidence of attending to the demand characteristics of the make-believe situation, by attending to the target function. A trial was coded as "attending to the target function" on the basis of certain verbalizations or actions. Verbalizations indicating that the child had the target function in mind were usually comments about the relevant property; e.g., "This [shoe] should have shoelaces" or "This [bowl] shouldn't have holes." The child could also show attention to the target function through action; e.g., choosing the dog bone as the phone for dialing by putting the dogbone to the ear as a make-believe receiver and making a dialing motion in the air.

The verbal data were examined in two additional ways. The first of these was a division of comments on the objects into two categories: those noting its suitability as a substitute (i.e., similarity to the referent, as in the comment "This [shoe] has string") and those comments noting its shortcomings as a substitute (i.e., difference between the object and the referent, as in the comment "This [spoon] needs a handle").

The verbal protocols were also examined in terms of qualitative categories, with a focus on the reflectiveness children exhibited in approaching the object substitution situation. The verbal categories which emerged from this examination are reported extensively in the following section.

Results and Discussion

Awareness of Object Suitability

On 65% of the object choices, children selected the target object, that is, the object best suited by its features for the make-believe situation. If the children were responding by chance alone, the percentage of the trials on which the target object would be selected is 16.6%. Even when only the two likeliest objects are considered, e.g., the rod and the plastic eggshell, the expected percentage of trials on which the target objects are selected is 50%. The obtained percentage of 65% is averaged across the six experimenter requests.

The percentages of target object selections ranged from 50% for the phone to 86% for the spoon. Later in this discussion we will consider factors which might account for the variation across objects in the numbers of children choosing the target object. At this point, we simply wish to note that there was a high degree of such variation. The hypothesis that children would make different object choices depending on the function the object was to serve in the make-believe play scenario was clearly upheld with some objects and less so with others. Overall, however, this hypothesis received support. We also found, as expected, that children exhibited their sensitivity to the anticipated function through their verbalizations and actions. When children picked an object other than the target, they nearly always showed that they were attending to the described function,

either verbally or behaviorally or both. On 92% of all trials children showed by their verbalizations or gestures that they were understanding and attending to the functions for which the various objects were to be used.

Verbalizations focusing on the object's suitability as a substitute were nearly twice as common as behaviors which took note of a shortcoming. This difference was found even though the experimenter asked each child, "Is there anything you think should be different, anything that is not good for a____? Is there anything we'd need to pretend for it to be a good____?"

A significant interaction was found between age and the tendency to focus on object suitability ($X^2 = 4.96$, $p < .05$). Older children showed the tendency to note object similarities more than younger children, while object shortcomings were noted equally across ages.

Spontaneous Comments on Making Object Substitutions

Children freely commented on their object choices. They spoke of the appropriateness of objects for the intended use, of problems with the objects as substitutes, of the lack of satisfactory choices, and of the difficulty in making up their minds. Such commentary, as a whole, reflects the fact that choosing objects for use in pretending is not an automatic process. Instead, selecting props for play is a reflective process in which the play participant maintains a self-awareness regarding his or her symbolic play activity. It is true that the tendency to ponder choices is probably heightened by the

experimental setting, in spite of our efforts to provide a casual, make-believe framework. Comments indicative of reflection and self-awareness have been noted to occur in the course of interactive free-play as well (e.g., Matthews, Note 3). It may be the case that covert comments are equally commonplace in solitary play.

The types of things children say when making object substitutions, we suggest, reflect the nature of the cognitive activity underlying their choices as well as the extent of the children's reflectiveness about their representational efforts. The principal types of verbalizations of this sort that we identified are the following:

A. Verbalizing satisfaction with object

1. Conveys satisfaction in finding an appropriate object without commenting on why it is suitable.

   Examples:

   "Ah, there is an envelope."

   "I found the bowl that would be good."

   "This is a good phone."

   "That's not a spoon, but it could be a spoon."

   "That's what I could find that looks most like a shoe."

2. Conveys satisfaction in finding appropriate object, commenting on why it is suitable.

Examples:

"This has shoelaces."

"I think this is a shoe. You know why? (demonstrates that it can be worn). That is why."

'This is a shoe because it's got string."

B. Verbalizing what's wrong with object(s) chosen

1. Conveys dissatisfaction with object(s) rejected without commenting on what's wrong.

Examples:

"There's no shoe."

"Too silly. This can't be a shoe. No."

"Not this one. This can't be good...not this, not this, not that, not that, and not this (about each object but the chosen one)."

"I don't see anything."

"This is not a good bowl."

"This is not a shoe (laughing)."

"Is this the telephone? No, probably not."

2. Conveys dissatisfaction with object(s) rejected commenting on what's wrong.

Examples:

(Looking for bowl for fish). "This (colander). No! No! No! No! No! The water will come out. This is better (flower pot)."

(Looking for shoe for tying). "It doesn't have any string."

(Looking for pitcher for pouring) "This one doesn't have a handle (pointing to the spout on other pitcher; confused about word). Needs to have a handle."

(Looking for bowl for fish) "I know which one that would not be a good one. This one (colander) would not because it has holes in it. The water can get out."

C. Verbalizing dissatisfaction with object chosen

1. Conveys some dissatisfaction with object chosen by commenting on what's wrong.

Examples:

"Maybe this into a --. I know how to make one of these into a telephone (holds object to ear)."

"This would be better with a handle (referring to pitcher with spout, selected for pouring water)."

2. Conveys some dissatisfaction with object chosen by modifying it (and commenting on modification).

Examples:

"Here's one part (bone for telephone receiver). I can't find the other part in here (finally adds dial)."

"This one (milk carton 'shoe') doesn't have one (a shoelace). Poke a hole in it and we could take this (lace from peg board 'shoe'). Get this for a shoelace."

"What's this? (looking at the bone 'receiver')? Can't be it. It has to be -- it could go here, like that (puts 'receiver' beside 'dial')."

"We need to put this (picks up 'scooping spoon,' mumbling, then 'stirring spoon'). Hm-m-m, you have to put that together somehow (puts scoop at end of stirrer; finally, puts scoop back). I'm pretending something's right here."

D. Pondering choices verbally

1. Verbalizes that more than one object has appeal.

Examples:

"This or that?"

"Let's see; which pitcher should I take?"

"I don't know which one."

"I can't find the goodest one."

"There are two pitchers."

"Could this be a phone...? (Experimenter: "Could it be?") ...I don't know."

"Is this it? No This? No. This could be it."

"I see two pitchers."

2. Talks while choosing, "thinking aloud."

   Examples:

   "Envelope? (look at object) Yes."

   "Look in there and see what would be good for a shoe (looking in drawer). Good for a shoe, good for a shoe. Is this? (puts shoe on foot). It probably will."

   "Where is the telephone anyway? Is this the telephone? No, probably not."

Metacognition and Symbolic Play:
The Value of Verbal Data

Comments of the types described are of considerable interest in what they tell us about preschool children's use of objects in pretend play. First, it is clear from these spontaneous remarks that the children have standards about what constitutes a suitable substitute object in a given situation and that the children make their choices after considerable reflection. A request by an adult for an object substitute in make-believe was readily accepted by all the children, but they did not seem to think that any object would do equally well. The children went through an evaluation process, sometimes very explicit, considering the available objects with respect to the criteria they were seeking to meet.

Second, the children's comments include thoughts about <u>why</u> a given object is a good choice, <u>why</u> a rejected object is not desirable, and what is less than ideal about a chosen object though it may be the best available. Sometimes children talk about how difficult it is to decide between one object and another or express their dissatisfaction with all the available choices. On occasion we hear them ask themselves aloud whether or not a given object will do. In some of these remarks the children show an awareness of their own evaluating processes or of the representational task. These are particularly interesting in light of recent interest in the emergence of metacognition.

In many of the verbalizations we see the child doing what might be thought of as transforming the ocject and imposing a new identity upon it. At the least, children show a tendency to use a verbalization to bridge the gap between the object as it is and as it should be for the play episode. It is worth noting that similar verbalizations have been observed in other activities where children are representing something in the world. In art, for example, investigators have found that children frequently make spontaneous comments to supplement their drawings or clay constructions (Cocking & Copple, 1979; Golomb, 1974; Copple, Cocking, & Waxman, Note 2). Children often perceive a discrepancy between what they are trying to represent and what they are able to achieve (in the case of their own creations) or select (in the case of object choices). In these instances, investigators have found children are not satisfied. Alongside their imaginative abilities, the children clearly manifest their active use of standards or criteria of representation.

Despite the narrow age range in the current study, an overall increase was found with age in the extent to which children showed a reflectiveness about choosing objects for the play scenarios. There were also marked individual differences. Some children verbalized what they were thinking on every occasion, while other children rarely commented.

The unelicited comments of the children not only tell us that they had representational criteria but also indicate the nature of these criteria. The children's comments reveal what sorts of

features of the objects mattered to them and which did not. With respect to the issue of object features, we can make a few generalizations, based on the study:

1. Physical features versus functional features in object choices:

   Physical features not related to function were rarely mentioned.

For example, children never commented on a discrepancy of color or substance (e.g., that the phone should be black, the spoon made of metal, or the shoe of leather). On the whole, children did not mention characteristics that might be desirable for the real object but not necessary for pretend play purposes. For example, the durability of the shoe, which was made of cardboard, was never criticized.

2. Essential versus non-essential functional features in object choices:

   The features needed to perform the function called for in the scenario were more often commented on than were other functions of the object.

Children often commented about what made the object suitable for the function called for by the make-believe scenario. This finding parallels the object choice results; i.e., the children tended to choose the item with the feature linked to the object's function in the dramatic play episode.

3. "Disjunct features" in object choices:

The more "disjunct" the feature, the more important it seemed to the child.

Children more often tended to comment on the absence of features which were disjunct or separable, that is, parts which could be detached visually or even manipulated separately. For example, children frequently noted the absence of the laces for the shoe; the dial or the receiver for the telephone. In contrast, less disjunct features such as the long,straight portion of the spoon and its concave part were not so often commented on. This may be partly a matter of the ease of describing or demonstrating what was missing for the more disjunct features or parts. But it is probably no harder to say, for example, "the round thing" than "receiver" or "the part that you talk on." A more important reason for this difference seems to be the separateness of the actions one would perform in using the object.

When pretending to pour, one can perform the action without actually having a spout on the pitcher. In contrast, suppose you are pretending to make a phone call. There are two separate parts of telephones which are involved in making a call: holding the receiver and dialing, and each has a separate action associated with it. In such cases, children seemed to see both parts as necessary. Supplementations through action, verbalization, and combining objects were most common on the telephone and the shoe. Incidentally, this appears to be linked to the large

number of children choosing a non-target object on the telephone item. They wanted features for filling both functions of a telephone, so they chose either item -- the "dial" or the "receiver" -- and then supplied the rest through gestures.

Conclusions

The objective of the research was to examine the nature of the representation or prototypes underlying children's make-believe object uses, the types of mental activities through which objects are allowed to substitute for real objects, and the awareness children have of the processes involved in the choosing and the pretending.

The results lend support to the view of symbolic object use which Golomb (1977) has put forth. The children's choices show attention to the feature or features important for the functions the objects will serve in make-believe episodes. Other features of the objects are relatively less important to the child in comparison to the features linked to the actions s/he anticipates pretending to enact. The child does not operate with a single, unitary prototype of what a given object should be like. What children seek in an object shifts according to its anticipated make-believe use. These results can be added to those of Fein and Apfel (1979) in showing children's selectivity among objects on the basis of how the object will be used.

Many of the children showed a considerable degree of reflectiveness in their object choices. They hesitated, and sometimes they spontaneously talked about the difficulty of their choices, particularly with respect to weighing what was good about an object substitute, or about discrepancies they noticed between the substitute and their notions of the real thing. The children's verbalizations reflected an awareness of their own processes of evaluating and pretending. This awareness appears to be akin to what is termed and studied as metacognition. Our investigation indicates that the use of objects in make-believe play is not only a mentally-initiated activity, as emphasized by Golomb, Fein, Cocking and de Lacey, Tambourinni, and others, but one in which the children's awareness of their own mental processes and representational criteria is increasingly explicit, where the child's own activities are important to the process of understanding---which is the definition of Constructionism with which we began this report.

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Table 1

Warm-up Items

Prototype	Functional Emphasis	Materials
Newspaper	Reading	Magazine page
Pack of gum	Separating sticks of gum	thin, narrow strips of plastic

Play Episode Items

Prototype	Functional Emphasis		Materials	
	Script 1	Script 2	Script 1	Script 2
Spoon	Scooping	Stirring	½ eggshell	Wooden rod
Pitcher	Pouring	Carrying	Pitcher with spout	Pitcher with handle
Bowl	Holding fruit	Holding water	Colander	Lucite flowerpot
Envelope	Readability	Openability	Index card with writing	Clear vinyl glasses case
Shoe	Wearing	Tying	Milk container with top cut off	Pegboard with string between two holes
Phone	Talking	Dialing	Toy dog bone	Metal pinwheel mounted on a board

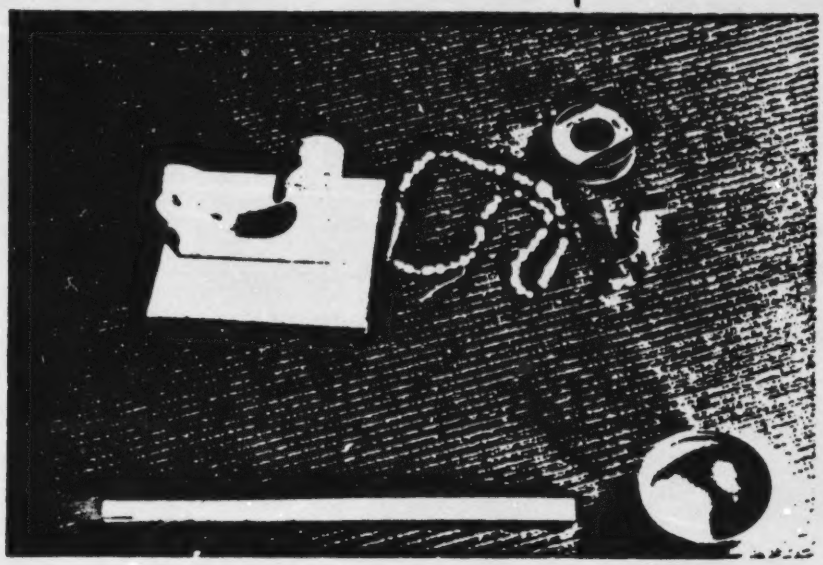

Figure 1